ATTACHMENT

9.2.7.c Failure Mode and Effects Analysis

Text Page 2 through 3

C-A-OPM Procedures in which this Attachment is used.		
9.2.7		

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approved: ***Signature on File*** _____
Collider-Accelerator Department Chairman

Date

A. Etkin

FAILURE MODE AND EFFECTS ANALYSIS

INTRODUCTION

A FMEA requires analysis of the system for all single and probable multiple equipment or operator failures that could cause personnel injury or significant equipment damage. The system shall remain safe for all reasonable postulated equipment failures or operator errors. The analysis is most profitably carried out in parallel with the design effort. A FMEA is best employed as a design tool, not an ad hoc documentation requirement.

PROCEDURE

A FMEA is primarily component oriented. Each component of the system should be reviewed for each possible failed state to determine the effect of the failure on the system and the possible safety consequences to the system. The component list shall include all active components. This includes valves, gauges, transducers, brakes, interlocks, and pressure and temperature switches. A risk assessment is determined for each hazard. This is the classification of hazard severity and probability of occurrence, as defined in ES&H Standard 1.3.3 Safety Analysis Reports / Safety Assessment Documents. Decisions shall be made concerning the adequacy of safety. The design shall be approved for safety, and unacceptable risks must be corrected.

DOCUMENTATION

The FMEA should individually list each postulated failure mode for each component. Each failure entry should explain the hazard list or risk assessment, and describe why the mode is failsafe or make a recommendation that will eliminate or mitigate the hazardous condition. See the worksheet at the end of this Attachment.

To be useful, the FMEA must be complete. Every failure of every component must be addressed. Normally this would include only single level failures. Probable multiple failures should also be examined.

Component_____

Location_____

Date_____

By_____

FAILURE MODE AND EFFECT ANALYSIS

COMPONENT	FAILURE OR ERROR MODE	HAZARD/EFFECT	RISK ASSESSMENT	REMARKS/RECOMMENDATIONS